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(54) IMPROVEMENTS RELATING TO PORTABLE LIGHTING UNITS

(71) We, ARTHUR GORDON ATKINSON and STUART PULFORD, both British subjects respectively of 4, Church Street, Addingham, Nr. Ilkley, Yorkshire and 810 Gleadless Road, Sheffield S12, Yorkshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to portable lighting units, and in particular concerns a lamp which is for decorative and/or illumination purposes.

It is known that decorative illumination effects can be obtained by directing light, by means of a simple single-element lens for projection, through a decorative membrane, sheet or the like onto a screen or wall but such arrangement requires considerable space and the projection system can be interrupted by persons or objects moving or being moved through the optical axis of the system.

An object of our invention is to provide a portable lighting unit having a self contained screen on which a novel decorative effect can be obtained.

According to the invention there is provided a portable unit comprising a casing housing a projection lens system and mounting means for mounting a decorative sheet or web to lie transversely of and intersecting the optical axis of the projection system, said unit further including a domed translucent screen mounted on the casing so as to curve convexly therefrom, the screen being positioned relative to the optical projection system so that in use the images of a decorative sheet or web appropriately mounted on said mounting means appears in focus over at least substantially all of the domed screen.

Preferably, the means for mounting the decorative sheet is adapted to move such sheet transversely of the said optical axis.

By the invention, the decoration of the decorative sheet or web when mounted on said mounting means will be projected substantially in focus, onto the screen and by the preferred arrangement movement of the decoration images over the screen is achieved by moving said sheet or web.

Where the sheet is a disc, the said mounting means may include a geared electric motor coupled to derive its driving power from an electrical supply to illuminate the source of the projection system, and adapted to be drivingly connected to the centre of the disc for rotation of same.

The projection source may be a tunsten halogen bulb and a reflector to one side of the bulb to direct the light towards the other side thereof, and the system may include matched lenses respectively for making the light from the source collimated and for converging the collimated light to the projecting lens means. The decorative disc may be located so as to lie between the projecting lens means and the adjacent matched lens.

Preferably also there is provided a light source mounting separate from the projection system and adapted to receive a bulb for illuminating the screen but not through the projection system, and including switch means positionable to make the projection system operative, or the light source mounting operative at the will of a person operating the switch, when the unit is connected to a suitable power supply, and the light source mounting has a bulb mounted therein.

The light bulb may be a conventional vacuum light bulb.

The screen preferably is of translucent plastics material such as acrylic material e.g. the materials sold under the trade marks PERSPEX and PLEXIGLAS.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Fig. 1 and 1A respectively are a side elevation and a perspective elevation of a lighting unit according to the invention; and

Fig. 2 is a cross-sectional elevation of the lighting unit of Figs. 1 and 1A.

Referring to the drawing, it will be seen that the lighting unit illustrated is generally spherical in shape and comprises a substantially hemi-spherical casing 10 which carries a substantially hemi-spherical domed screen 12 which is translucent and preferably, is of plastics material such as opal PERSPEX (Registered Trade Mark). The casing 10 and screen 12 are joined together approximately at a diametral region of the unit.

The casing 10 is formed at its base region into a cylindrical stand position 10A in order to provide a base on which the unit can stand.

Referring particularly to Fig. 2, inside the unit there is a projection system which lies on vertical central line of the unit and such projection system comprises a tungsten halogen lamp 14, two matched lenses 16 and 18 and a projection lens 20, said projection lens 20 being located substantially at the centre of curvature of the screen 12 so that images projected by said lens 20 onto at least substantially all of the screen will be in focus. To the lower side of the lamp 14 is a conventional reflector 22 which serves to ensure that the majority of the light issuing from lamp 14 is projected to lens 16. At lens 16 the light is collimated and lens 18 serves to reconverge the light back to the lens 20 wherefrom it is spread throughout the whole of the inside of screen 12. Between the lens 18 and the lens 20 there is interposed a decorative disc 24 which is drivingly connected at its centre mounting means in the form of a geared motor 26. Rotation of motor 26 effects rotations of the disc 24 and images of various colours carried by the disc 24 pass between the lens 18 and lens 20. This disc 24 is generally translucent so that the coloured images thereof are projected onto the screen 12 and such images move across the screen 12 as the disc 24 rotates.

The lenses 16, 18 and 20, the motor 26, the lamp 14 and the reflector 22 are carried on suitable chassis elements such as illustrated at 28. The unit also houses a transformer 30 which serves to step down the supply voltage to the correct voltage to supply the lamp 14. This voltage may be for example 12 volts. The motor 26 derives its power direct from the supply.

The unit also houses a conventional light bulb 32 to the mounting of which power may be applied. The mounting for the bulb 32 may be a conventional bayonet fitting. This bulb 32, which is carried by its own mounting, is separate from the projection system previously described and is located so that it can illuminate the screen 12 and indeed the space surrounding the unit.

The unit has a three position switch 34 (Fig. 1) by which an operator may connect the projection system to the power source through the transformer 30 whereby moving decorative images are created on the inside of screen 12 and are visible from outside the unit or the switch may be positioned to illuminate only lamp 32 and the unit used for space lighting.

The switch 34 has a neutral position in which neither the lamp 32 nor the projector system is operative.

It is desirable that the screen should be viewable from a plurality of positions around the unit, and from the side of the unit as well as from the top. Furthermore, the decorative sheet need not be rotated through the projection system; it may be in the form of an endless web and be for being moved rectilinearly through the projection system. Indeed, in another possibility, the decorative sheet or web may not move at all. In all cases, it is preferred that the decorative sheet or web be capable of removal from the unit and replaceable with another sheet which gives rise to the display of different images on the screen.

WHAT WE CLAIM IS:—

1. A portable lighting unit comprising a casing housing a projection lens system and mounting means for mounting a decorative sheet or web to lie transversely of and intersecting the optical axis of the projection system, said unit further including a domed translucent screen mounted on the casing so as to curve convexly therefrom, the screen being positioned relative to the optical projection system so that in use the images of a decorative sheet or web appropriately mounted on said mounting means appears in focus over at least substantially all of the domed screen.

2. A portable lighting unit according to claim 1, including a light source mounting separate from the projection system and adapted to receive a bulb for illuminating the screen but not through the projection system and including switch means positionable to make the projection system operative, or the light source mounting operative at the will of a person operating the switch, when the unit is connected to a suitable power supply, and the light source mounting has a bulb mounted therein.

3. A lighting unit according to claim 2, wherein the mounting is for a conventional light bulb of the bayonet fitting type.

4. A lighting unit according to any of claims 1 to 3, wherein the projection system includes a projecting lens means located substantially at the centre of curvature of the domed screen, so that images projected by the lens means will be in focus over at least substantially the whole screen.

5. A lighting unit according to Claim 4, wherein the projection source is a tungsten halogen bulb and a reflector to one side of the bulb to direct light towards the other side thereof, and the system includes matched lenses respectively for making the light from the source collimated and for converging the collimated light to the projecting lens.

6 A lighting unit according to any preceding claim wherein the mounting means for mounting the decorative sheet or web is adapted to move such sheet transversely of the optical axis of the projection system.

7. A lighting unit according to Claim 6, wherein the means for mounting the decorative sheet includes a geared electric motor adapted to rotate a decorative sheet, in disc form, though said optical axis.

8. A lighting unit according to any preceding Claim, wherein the screen is of translucent acrylic plastics material.

9. A lighting unit substantially as herein before described with reference to the accompanying drawing.

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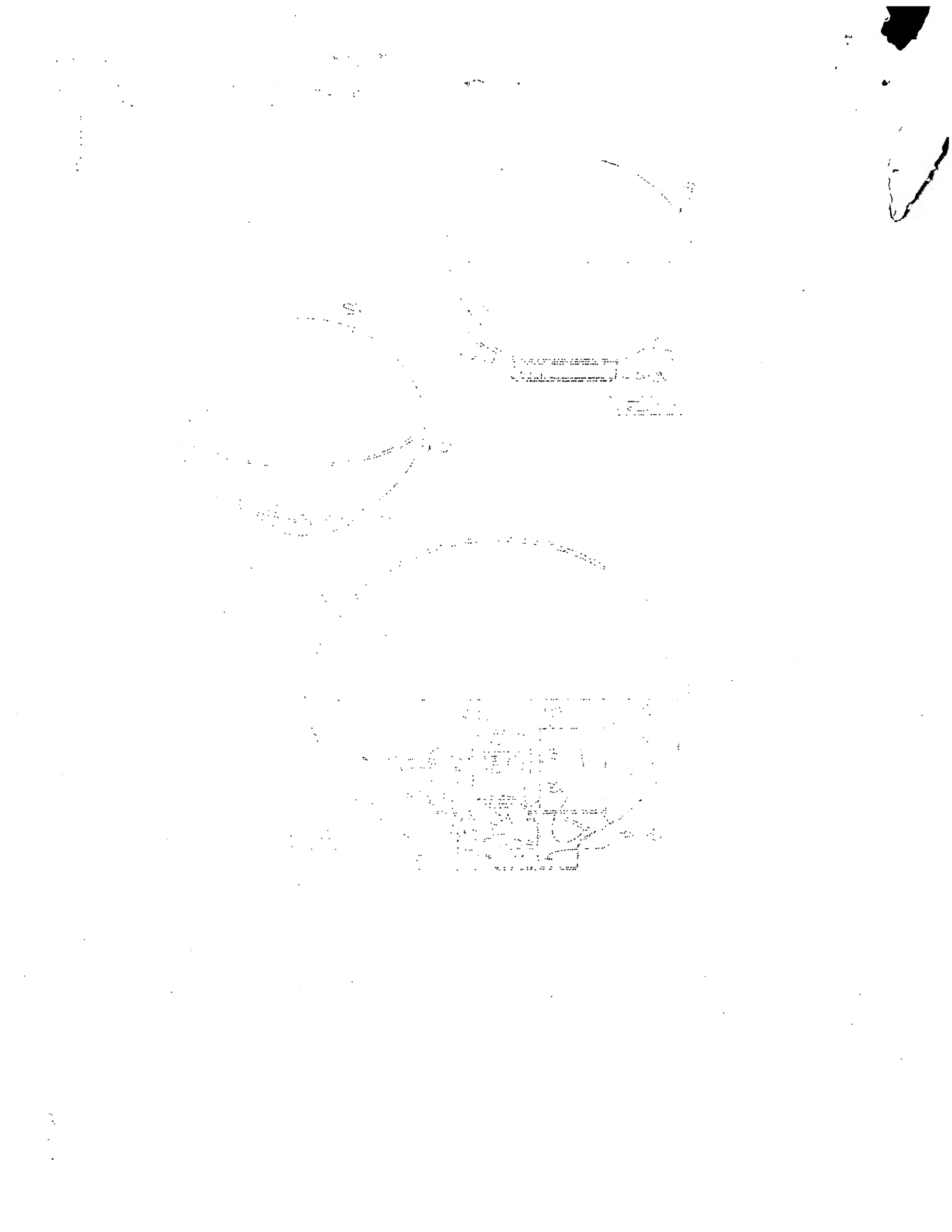

1485113 COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale

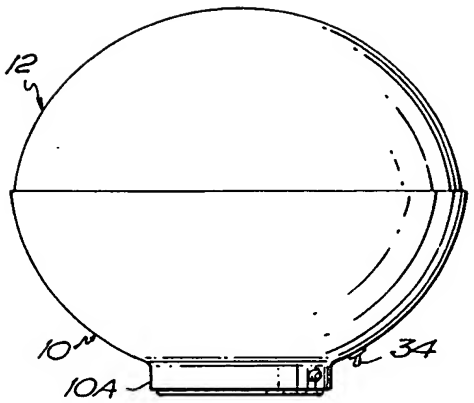

FIG.1

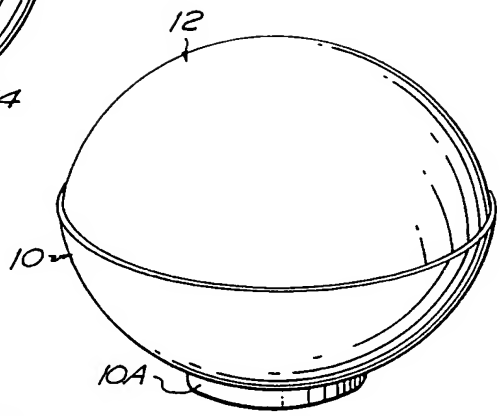

FIG 1A

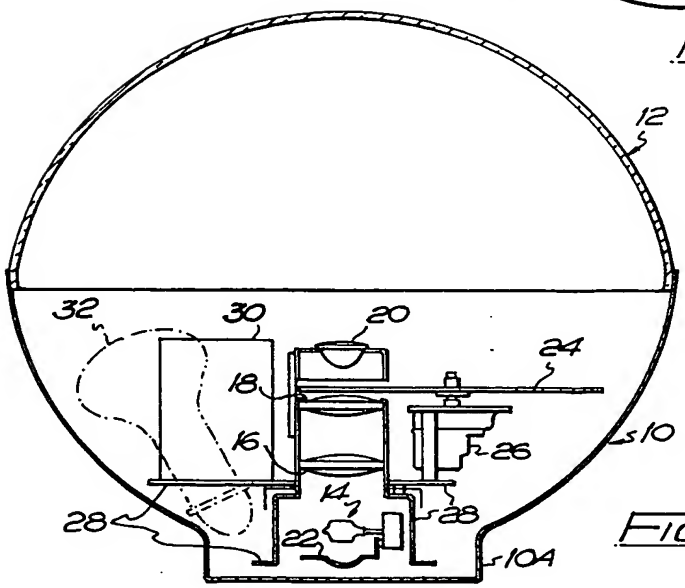

FIG.2